



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,159	10/14/2005	Tsuyoshi Nakamura	SHIGA7.030APC	9070
20995 7590 06/04/2008 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614				
EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
06/04/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
eOAPilot@kmob.com

Office Action Summary

Application No.

10/553,159

Applicant(s)

NAKAMURA, TSUYOSHI

Examiner

ANCA EOOF

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-13 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 03/10/2008

DETAILED ACTION

1. Claims 1-5 and 7-13 are pending in the application. Claim 6 is canceled.
2. The foreign priority document JP 2003-114044, filed on April 18, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

Election/Restrictions

3. Newly submitted claims 12-13 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 12-13 are directed to a cured alkali-soluble underlying film, which is different from the composition for forming an underlying film of claims 1-9, the method of forming a multilayered resist of claim 10 and the laminate of claim 11.

Since the applicant has received an action of the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 12-13 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraph of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1774

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Niikura et al. (US Patent 6,106,994).

With regard to claims 1-2, Niikura et al. disclose a composition comprising an alkali-soluble resin (A) (column 2, lines 61-62, which can be a novolak resin obtained from a phenol compound, such as m-cresol, p-cresol and an aldehyde, such as formaldehyde (column 7, lines 49-52).

Niikura et al. further disclose that low molecular weight fractions of novolak resin have been removed (column 7, lines 53-54) so the novolak resin free of low molecular weight compounds meets the limitation of the instant application.

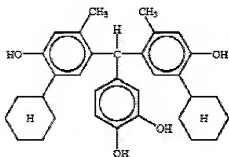
The fact that the material of the instant application is used "for forming an alkali-insoluble underlying film between a substrate and a photoresist layer" is merely an intended use and adds no patentable weight to the claim.

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also *Rowe v. Dror*, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) ("where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation") (MPEP 2111.02- II Preamble Statements Reciting Purpose or Intended Use)

The composition of Niikura et al. which has the same components as the undercoating material of the instant application fully meets the limitation of claim 1.

With regard to claims 7-9, Niikura et al. further disclose that the composition comprises (B) a polyphenol diester produced by esterifying a polyphenol compound having 2 to 10 phenolic hydroxyl groups with a naphthoquinone-diazidesulfonyl halide (column 2, lines 19-23 and lines 60-62).

Niikura et al. specifically disclose the esterification of the polyphenol compound of formula (I):



(I) with naphthoquinone-1,2-diazide-5-sulfonyl chloride (5-NQD) (Synthetic Example 4 in column 10, lines 47-67).

The esterification leads to a mixture comprising 87.36 % diester.

The compound of formula (I) has a molecular weight of 487 g/mol and is equivalent to the phenolic derivative with a molecular weight of 200 or more of claim 7 of the instant application.

The diester obtained in the esterification process of the compound of formula (I) with naphthoquinone-1,2-diazide-5-sulfonyl chloride (5-NQD) is equivalent to the compound of formula (II) of claim 8 of the instant application, where two of D^1 , D^2 , D^3 are naphthoquinone-1,2-diazidosulfonyl group, and the other substituents D^1 , D^2 , D^3 are hydrogen atoms, $l=1$, $m=1$ and $n=0$.

The compound of formula (I) above is bis(5-cyclohexyl-4-hydroxy-2-methylphenyl)-3,4-hydroxyphenylmethane so the limitation of claim 9 is met.

6. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US Pg-Pub 2003/0064319).

With regard to claims 1-5, Saito et al. disclose a composition comprising a novolak resin (A) (abstract). The novolak resin is obtained by addition condensation of aromatic compounds with phenolic hydroxyl groups, such as phenol, m-cresol, p-cresol with aldehydes (par.0022).

Saito et al. specifically disclose the synthesis of a cresol novolak resin, by the condensation of a mixture of 60 parts m-cresol and 40 parts p-cresol with formaldehyde (par.0073). The low molecular weight fractions of the resin were removed by fractionation (par.0073) so the cresol novolak resin free of low molecular weight compounds meets the limitation of the instant application

The fact that the material of the instant application is used "for forming an alkali-insoluble underlying film between a substrate and a photoresist layer" is merely an intended use and adds no patentable weight to the claim (MPEP 2111.02- II Preamble Statements Reciting Purpose or Intended Use).

The composition of Saito et al. which has the same components as the undercoating material of the instant application fully meets the limitation of claims 1-5.

Art Unit: 1774

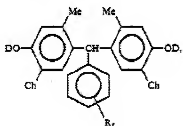
7. Claims 1-2 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Doi et al. (US Patent 5,401,605).

With regard to claims 1-2, Doi et al. disclose a photosensitive resin composition comprising an alkali-soluble novolac resin (abstract), wherein the novolac resin is obtained by the condensation reaction of phenol, cresol and xyleneol with an aldehyde (column 6, lines 62-65). The low molecular weight species are removed by fractionation (column 7, lines 2-3).

The fact that the material of the instant application is used "for forming an alkali-insoluble underlying film between a substrate and a photoresist layer" is merely an intended use and adds no patentable weight to the claim (MPEP 2111.02- II Preamble Statements Reciting Purpose or Intended Use).

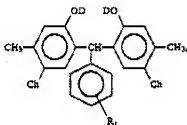
The composition of Doi et al. which comprises a novolac resin free of low molecular weight species, same as the undercoating material of the instant application, fully meets the limitation of claim 1.

With regard to claims 7-9, Doi et al. disclose that the photosensitive composition further comprises a photosensitizing agent (abstract), which may be represented by the formulas (II) and (III)



(compound of formula (III) in column 3, lines 10-20 and

Art Unit: 1774



(III) (compound (IV) in column 3, lines 25-35),), wherein at least one of the groups D is a naphthoquinone 1,2-diazide sulfonyl group and the remainder are hydrogen atoms, each R is a hydrogen, a hydroxy group, an -OD group, Me is a methyl group, Ch is a cyclohexyl group and t is 1, 2 or 3 (column 3, lines 39-40 and column 2, line 65-column 3, line 2).

The compounds of formulas (II), (III) above are equivalent to the compounds of claim 8 of the instant application.

Doi et al. further disclose that the compounds above may be obtained by the condensation reaction of a tris(hydroxyphenyl)methane compound, such as bis(5-cyclohexyl-4-hydroxy-2-methylphenyl)-3,4-dihydroxyphenyl methane with naphthoquinone-1,2 diazide sulfonyl halide (column 3, line64-column 4, line 30 and column 4, lines 61-21).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaedeli et al. (US Patent 6,146,793) in view of Niikura et al. (US Patent 6,106,994).

With regard to claim 10, Schaedeli et al. disclose a process for the lithographic treatment of a substrate by means of a multilayer technique, said process comprising the following steps:

- providing the substrate with a first coating of a film-forming aromatic polymer material;
- curing the first coating;
- applying a photoresist coating on the first coating;
- irradiating the coated substrate with radiation;
- subjecting the irradiated substrate to heat treatment;
- treating the irradiated substrate with an aqueous alkaline developer solution until the irradiated regions of the second coating are removed;
- treating the substrate with an oxygen-containing plasma until the first coating is completely removed on those places where it is not covered by the second coating (column 6, lines 10-30).

Schaedeli et al. disclose that the first coating (undercoat layer) are novolak resins, such as formaldehyde cresol or formaldehyde phenol novolaks (column 6, lines 31-36) but fail to disclose the amount of low molecular weight compounds present in the resins.

Niikura et al. disclose compositions comprising novolak resins obtained from a phenol compound, such as m-cresol, p-cresol and formaldehyde, which present high

Art Unit: 1774

thermostability. The low molecular weight fractions of the novolak resin have been removed (column 7, lines 49-54).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the novolak resins free of low molecular weight fractions as disclosed by Niikura et al. for the first undercoating (undercoat layer) of Schaedeli et al., since Schaedeli et al. disclose the use of novoplac resins for the first coating (column 3, lines 54-59) and in order to take advantage of the high thermostability of the novolak resin free of low molecular weight fractions (Niikura et al., column 7, lines 49-54).

The fact that the first coating (underlayer) is removed during an etching step and not during the step of development with an aqueous alkaline developer solution (column 6, lines 10-30) proves that the first coating (underlayer) of Schaedeli modified by Niikura is alkali-insoluble, as required by the instant application.

With regard to claim 11, Schaedeli et al. disclose a multilayer structure comprising a substrate, a first coating (undercoat layer) and a second coating comprising a photoresist comprising a terpolymer and a photoacid generator.

Schaedeli et al. disclose that the first coating (undercoat layer) are novolak resins, such as formaldehyde cresol or formaldehyde phenol novolaks (column 6, lines 31-36) but fail to disclose the amount of low molecular weight compounds present in the resins.

Niikura et al. disclose compositions comprising novolak resins obtained from a phenol compound, such as m-cresol, p-cresol and formaldehyde, which present high

thermostability. The low molecular weight fractions of the novolak resin have been removed (column 7, lines 49-54).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the novolak resins free of low molecular weight fractions as disclosed by Niikura et al. for the first undercoating (undercoat layer) of Schaedeli et al., since Schaedeli et al. disclose the use of novoplac resins for the first coating (column 3, lines 54-59) and in order to take advantage of the high thermostability of the novolak resin free of low molecular weight fractions (Niikura et al., column 7, lines 49-54).

The fact that the first coating (underlayer) is removed during an etching step and not during the step of development with an aqueous alkaline developer solution (column 6, lines 10-30) proves that the first coating (underlayer) of Schaedeli modified by Niikura is alkali-insoluble, as required by the instant application.

Response to Arguments

10. Applicant's arguments filed on March 10, 2008 have been fully considered but they are not persuasive:

On page 5 of the Remarks, the applicant argues that Niikura et al, disclose a positive photosensitive composition comprising an alkali-soluble resin and a diester, wherein the alkali-soluble resin is a novolak resin (column 6, lines 57-60). In contrast, the amended claims recite an alkali-insoluble underlying film/photosensitive composition.

The examiner would like to point out the fact that the amended claim 1 recites "an undercoating material for forming an alkali-insoluble underlying film", wherein the amended claim 1 refers to the undercoating material and the intended use "for forming an alkali-insoluble underlying film" does not add any patentable weight to the claim.

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also *Rowe v. Dror*, 112 F.3d 473, 478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997) ("where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention, the preamble is not a claim limitation") (MPEP 2111.02- II Preamble Statements Reciting Purpose or Intended Use)

Niikura et al. disclose a composition comprising a novolak resin free of low molecular weight fractions so the composition of Niiura et al. fully anticipates the amended claim 1 of the application.

On page 6 of the Remarks, the applicant argues that Saito et al. disclose a negative photoresist comprising a novolak resin (A), which is preferably soluble in alkali (par.0022) while the instant application refers to an underlying film obtained by using the undercoating material of the invention is alkali-insoluble.

The examiner would like to point out the fact that the amended claim 1 recites "an undercoating material for forming an alkali-insoluble underlying film", wherein the amended claim 1 refers to the undercoating material and the intended use "for forming an alkali-insoluble underlying film" does not add any patentable weight to the claim (MPEP 2111.02- II Preamble Statements Reciting Purpose or Intended Use).

The composition of Saito et al. comprises a cresol novolak resin free of low molecular weight fractions (par.0073) so it meets the limitation of amended claim 1.

The applicant also argues that the underlying material in the claims forms an alkali-insoluble underlying film by thermal curing and does not change alkali solubility upon exposure while the composition of Saito et al. changes solubility upon exposure.

The examiner agrees with this statement but would like to remind the applicant that Saito et al. is used only for the rejection of the underlying material composition claims and not for the claims regarding the underlying layer formed by curing the underlying material.

On pages 6-7 of the Remarks, the applicant argues that the underlying film containing a novolak resin is alkali-insoluble and does not change alkali solubility upon exposure to radiation but, in contrast, the novolak resin of Niikura et al. is alkali-soluble and changes alkali-solubility upon exposure to radiation.

The examiner agrees with the statement but would like to show that in the rejection of claims 10-11 under 35 USC 103(a) over Schaedeli in view of Niikura, Niikura is relied upon for the teaching that is advantageous to remove the fractions of low molecular weight from the novolak polymer in order to obtain high thermostability (see par. 7 of the previous Office Action). Niikura et al. is not relied upon for teachings regarding the solubility or insolubility of the underlayer comprising a novolak resin.

It is clear from the teachings of Schaedeli that the first coating/underlayer is alkali-insoluble since it is not removed during a development step with an aqueous alkali

developer but it is removed during an etching step performed after the development (column 6, lines 10-30 of Schaedeli et al.).

The examiner maintains the position that one of ordinary skill in the art would have had the motivation to apply the teachings of Niikura et al. and use a novolak resin free of fractions of low molecular weight as resin for the first coating/underlayer of Scahedeli et al, since Schaedeli et al. clearly teach the use of novolak for the first coating/underlayer (column 6, lines 31-36) and in order to obtain higher thermostability of the first coating/underlayer (column 7, lines 49-54 of Niikura et al.).

Conclusion

11. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on March 10, 2008 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1774

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795